

WHAT IS CLAIMED IS:

1. An ammonia sensor comprising an element section, the element section including a pair of electrodes and a sensitive section contacting the paired electrodes, characterized in that:

the sensitive section contains a solid, super-strong acidic substance other than a zeolite, the acidic substance having an acidity of ≤ -11.93 as determined by Hammett acidity function H_0 .

2. The ammonia sensor as claimed in claim 1, wherein the solid, super-strong acidic substance comprises a primary component containing an oxide and a secondary component containing an oxide or an oxide ion, the primary and secondary components being chemically bonded to one another.

3. The ammonia sensor as claimed in claim 2, wherein the primary component contains an oxide selected from the group consisting of Fe_2O_3 , TiO_2 , ZrO_2 , HfO_2 , SnO_2 , Al_2O_3 and SiO_2 , and the secondary component contains at least one species selected from the group consisting of WO_3 , MoO_3 , B_2O_3 , SO_4^{2-} and PO_4^{3-} .

4. The ammonia sensor as claimed in claim 1, wherein the solid, super-strong acidic substance comprises at least one species selected from the group consisting of WO_3/ZrO_2 , $\text{SO}_4^{2-}/\text{ZrO}_2$, $\text{PO}_4^{3-}/\text{ZrO}_2$ and $\text{SO}_4^{2-}/\text{TiO}_2$.

5. The ammonia sensor as claimed in claim 1, wherein the solid, super-strong acidic substance comprises a composite oxide of a primary component containing a ZrO_2 carrier and a secondary component containing at least one species selected from the group consisting of WO_3 , MoO_3 , B_2O_3 , SO_4^{2-} and PO_4^{3-} , the secondary component being bonded to the surface of the carrier; and said carrier containing an agent for stabilizing the crystal structure of ZrO_2 .

6. The ammonia sensor as claimed in claim 5, wherein the crystal-structure-stabilizing agent comprises at least one species selected from the group consisting of CaO , MgO , Y_2O_3 , Yb_2O_3 and Ga_2O_3 .

7. The ammonia sensor as claimed in claim 5, wherein the ZrO_2 carrier contains at least 4 mol% Y_2O_3 .

8. The ammonia sensor as claimed in claim 5, wherein the ZrO_2 carrier contains at least 6 mol% Y_2O_3 .

9. The ammonia sensor as claimed in claim 1, wherein the solid, super-strong acidic substance has an acid content of at least 0.05 mmol/g.

10. The ammonia sensor as claimed in claim 2, wherein when the total amount of the primary and secondary components is taken as 100 mol%, the amount of the secondary component is 1 to 25 mol%.

11. The ammonia sensor as claimed in claim 1, wherein the sensitive section predominantly contains ZrO_2 and further contains W in an amount of 1.5 to 30 wt.% as reduced to WO_3 .

12. The ammonia sensor as claimed in claim 1, further comprising a protective layer covering the sensitive section.

13. The ammonia sensor as claimed in claim 1, further comprising a heater embedded in the insulating substrate or heating the element section.

14. The ammonia sensor as claimed in claim 13, comprising an insulating substrate and a heater embedded in the insulating substrate, wherein the paired electrodes are formed on the insulating substrate and the sensitive section is formed on the paired electrodes so as to cover the paired electrodes.

15. The ammonia sensor as claimed in claim 13, comprising an insulating substrate and a heater embedded in the substrate, wherein said paired electrodes comprise a lower electrode and an upper electrode, the lower electrode is formed on the insulating substrate, the sensitive section is formed on the lower electrode so as to cover the lower electrode, and the upper electrode is formed on the sensitive section.

16. The ammonia sensor as claimed in claim 13, further comprising an element temperature detection means for detecting the temperature of the element section, and a temperature regulation means for controlling the heater such that the element temperature falls within a predetermined temperature range.

17. The ammonia sensor as claimed in claim 14, further comprising an element temperature detection means for detecting the temperature of the element section, and a temperature regulation means for controlling the heater such that the element section temperature falls within a predetermined temperature range.

18. The ammonia sensor as claimed in claim 15, further comprising an element temperature detection means for detecting the temperature of the element section, and a temperature regulation means for controlling the heater

such that the element section temperature falls within a predetermined temperature range.

19. The ammonia sensor as claimed in claim 1, wherein the sensitive section consists essentially of a solid, super-strong acidic substance other than a zeolite, the acidic substance having an acidity of ≤ -11.93 as determined by Hammett acidity function H_0 .

20. The ammonia sensor as claimed in claim 1, wherein the sensitive section consists of a solid, super-strong acidic substance other than a zeolite, the acidic substance having an acidity of ≤ -11.93 as determined by Hammett acidity function H_0 .

21. An ammonia sensor for detecting the amount of ammonia contained in a sample gas, said ammonia sensor comprising an element section, the element section including a pair of electrodes and a sensitive section contacting the paired electrodes, characterized in that:

the sensitive section contains a solid, super-strong acidic substance other than a zeolite so as to exhibit super-strong acidity.

22. The ammonia sensor as claimed in claim 21, wherein the sensitive section exhibits an acidity of ≤ -11.93 as determined by Hammett acidity function H_0 .